Social networks and everyday activity limitations among older native and foreign-origin population in Estonia

Liili Abuladze and Luule Sakkeus

Estonian Institute for Population Studies, Tallinn University
Estonian Interuniversity Population Centre
P.O. Box 3012, 10514 Tallinn, Estonia
E-mail: liili@tlu.ee

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1. Introduction

The Second Demographic Transition paralleled with changes in social values towards more secularisation and anti-authoritarian attitudes, in weakening social cohesion and changing social networks. In ageing societies, such transformations may start to have an impact on intergenerational relationships as people live longer, but have less siblings and aunts-uncles – thus we have more opportunities to communicate across different generations, but we have fewer peers around. With a higher tendency of developing disabilities in old age among the younger old due to increasing longevity, personal relationships and available network resources become important for the well-being of older people.

Estonia is an ageing society, with a third of its population comprising of foreign-origin population. Although foreign-origin population has contributed to the ageing of the total population during recent decades, they indicate higher mortality and lower health status than the native population.

The health outcomes of older migrants are an under-studied field, but on the other hand, also the role of social networks in demographic processes lacks research. In this paper we address both of these issues by analysing the relationship between social networks and disabilities among the native and foreign-origin older population in Estonia. Since these populations have shown previously distinct demographic development, our analysis will provide more insight about the social networks and health outcomes of these two groups.

2. Background

There is an assumption of growing individualism that accompanied the so-called Second Demographic Transition (SDT) (Lesthaeghe & van de Kaa 1986). Some of the emerging features of the SDT included weakening social cohesion in the form of transforming network types, reduced social control and shifts in socialisation values (Lesthaeghe & Neels 2002). Therefore implications of weakening social ties among generations and family members emerge. However, evidence shows that the new transforming social relationships are very complex with a record number of multiple generations alive while the intra-generational ties have decreased (Bengtson 2001, Dykstra & Fokkema 2011). As social networks can facilitate elderly support mechanisms, transformations in relationships can have implications on older persons' social networks and hence their well-being.

On a macro level, altering social networks during the SDT suggest that different population groups, originating from divergent demographic transition phases, but living next to each other at the same historical time-point might have diverging social networks at this observed one point in time (Lesthaeghe & Neels 2002). Thus migrant populations can indicate different kinds of networks, firstly due to having later timing of the demographic transition than the natives. Secondly, migration experience requires also a certain set or types and quantity of social networks which might remain different from the natives also at old age (Oishi et al. 2013).

As people age, various health malfunction conditions appear more frequently. Some evidence shows that elderly migrants tend to be relatively worse-off in terms of self-perceived health and functioning in Germany, France, the Netherlands, Sweden and Switzerland and therefore these groups also indicate higher usage of physicians than the native populations (Solé-Auró& Crimmins 2008, Solé-Auró et al. 2012). Migrants in

Switzerland seem to have especially large health problems compared to their native counterparts in terms of self-perceived health status, likelihood of having ADL or IADL problems, frequency of accidents as well as access to health care (Solé-Auró & Crimmins 2008, Bolzman et al. 2004). In addition, migrants have indicated higher risk of poor emotional health in comparison to their native counterparts already from midlife in the US (Angel et al. 2001). In Estonia, migrants have 25% higher probability of disability and for decades also a lower life expectancy than the native population (Sakkeus & Karelson 2012).

Older migrants' networks can include smaller amount of or fewer contacts with family ties than those of the native population because parents, siblings and other relatives have remained in origin countries. Therefore in some countries migrants have less relatives living nearby or who to rely on compared to natives (Bolzman et al. 2004, Stanaway et al. 2011). On the other hand, there is evidence of migrants using their networks more often than the native population, for example in their migration or residential moves (Liu 2013, Oishi et al. 2013), but also in search of jobs (Kazjulja & Roosalu 2011).

There is a lack of deeper understanding of the characteristics of migrant social networks, especially of older migrants and their associations with health outcomes. Our study will attempt to fill in some of the gaps by analysing whether migrants' networks contribute to better or worse coping of older disabled migrants compared to the native population.

Firstly, it is important to understand whether there exist any social ties and what is the quantity of such resources, making the size of social networks one of the determinants of well-being (Cornwell 2009). Some recent research suggests that mobile societies and active people (i.e. also migrants) tend to have larger networks, thus potentially having a better 'starting point' (Oishi et al. 2013). Such large networks often consist of so-called weak ties, i.e. those that provide new information but do not supply on-going care (Granovetter 1973). Liu (2013) recently showed that weak personal ties play a crucial role in male migration and strong personal ties play a role in female migration from Senegal to European countries, thus giving an indication of the importance of strength of ties among migrants. With ageing, migrants may have lost weak ties or may have developed them into strong ties, thus preserving their special networks that might be divergent from that of natives and therefore well-being at older ages may vary between the populations. Cornwell (2009) has shown that with increasing functional disability strong ties remain whereas weak ties drop out of the network. Strong ties usually refer to family members or very close friends with whom the required reciprocity can be at a lower level than with acquaintances (Cornwell 2009).

Partner, children and neighbours have been one of the main providing care sources for older disabled people (Wenger 1997). The number of friends and relatives decreases with age, due to their own declining health and death. But also weaker ties – mostly friends - drop out of the network when activity limitations emerge because closer ties are easier to maintain as these are often embedded in familialistic environments, requiring less reciprocity compared to weak ties (Cornwell 2009). Hence also the composition of personal social networks and types of network members influence old-age well-being and care opportunities.

A larger network might not always mean more communication – sometimes smaller networks are those with higher contact frequency which in this case might indicate also more care resources from these small networks. On the other hand, a person might not be able to communicate with their network members as frequently as before due to ageing and developing disabilities, which then may result in a reduction of contact frequency (Cornwell 2009). Therefore contact frequency with network members is another indicator of the well-

being of older people. This introduces an element of inequity which can jeopardize social relationships and reduce the size of networks, while at the same time increasing the number of contacts that one has with those who remain in the network might counteract to that (Cornwell 2009, Oishi et al. 2013).

Satisfaction can be considered as an integral indicator of social networks that marks the satisfaction level despite the changes in network size, type and contact frequency due to age and onset of disabilities. A positive association has been found between network size and satisfaction in Europe previously (Stoeckel & Litwin 2013). In our analysis, we use satisfaction with relationships as an integral proxy for not feeling loneliness and social isolation as well as an indicator of quality of their relationships. In several studies, satisfaction has been found to be one of the most influential indicators to subjective well-being in older ages (Pinquart & Sörensen 2000) and thus might have an impact also on health outcomes of foreign-origin population.

2.1 The Estonian case

Estonia is one of the countries in Europe that has been ageing for the last couple of decades due to low fertility rates and increasing longevity. The share of population that is 65 and older has increased in Estonia from 10,5% in 1960 to 18% of the total population in 2013. Similarly, the population aged 50 and above has risen during the same period from 27,1% to 38%. The share of children (ages 0-14) has fallen from 22,9% in 1960 to 15,6% in 2013 (Statistics Estonia 2013). Total fertility rates have plunged from 2,16 in 1970 to 1,59 in 2012 (Statistics Estonia 2013).

Life expectancy at birth reached 71,09 for men and 81,15 for women in 2011 in Estonia (Statistics Estonia 2013a). Despite that improvement, Estonian health and morbidity indicators are still among the worse in Europe. Estonian women (by self-reported ethnicity) at the age of 65 can expect to have 6,91 healthy life years (HLY) and Estonian men at the age of 65 can expect to have 5,52 HLY, according to the 2011 Estonian census data. Non-Estonian women (by self-reported ethnicity) can expect to have 5,03 HLY and non-Estonian men 4,88 HLY at the age of 65 (Statistics Estonia 2013b). This is below the EU27 average of 8,6 HLY in 2011 for both women and men (Eurostat 2013). Data from the SHARE 4th wave indicate that Estonia had the highest disability prevalence compared to other participating European countries (Abuladze & Sakkeus 2013).

One third of the Estonian population is comprised of foreign-origin population coming mostly from the former Soviet Union regions – the majority being Russians (Sakkeus 2007). During the post-war decade, immigration flows were the highest ever recorded in Estonia, with a peak of 45000 migrants entering in 1955 which was almost 4% of the total Estonian population in that year (paralleled with high emigration which amounted to 35000 people per year). Migration flows started to decrease only after the mid 1980-s, but the immigrant population that remains in the country originates almost equally from each decade since World War II (Sakkeus 1994, Sakkeus 2007).

Foreign origin population in Estonia consists of larger shares of women (due to their higher immigration rates, longer life expectancy throughout the decades, and thus nowadays mainly contributing to rapid ageing in the country). Men die about 10 years earlier on average than women in Estonia, but the lag in life expectancy between men and women among foreign-origin population has been bigger (fluctuating between 11-12 years recently) than among natives and is not showing clear trend of diminishing (Statistics Estonia 2013b). However, this is in somewhat contrast with the situation where foreign origin population in

Estonia have equivalent, or in some cohorts even higher education levels than the native population. Higher educational attainment is often related to better labour and health outcomes (e.g. Shkolnikov et al. 2007, Mackenbach et al. 2008).

The different timing of the onset of the demographic, health and mobility transitions of different countries and regions in the Soviet Union made Estonia one of the main receiving countries for immigrants after World War II (Katus et al. 2005). As indicated earlier, foreign origin population in Estonia have lower number of healthy life years, 5-6% shorter life expectancy for men and somewhat shorter for women (1-2%), but it is also resulting in higher disability rates which we would rather expect from those population groups who have higher survival rates (Sakkeus & Karelson 2012). This controversial situation is one of the motivations to seek answers in their social networks which could be one of the determinants not alleviating the disablement process among the foreign origin population.

In a previous study on the relationship between social networks and old-age disability Estonia proved to be one of the familialistic societies in Europe in terms of family ties being the dominant relationship categories among the more disabled population (Abuladze & Sakkeus 2013). Estonia has also one of the highest disability risks from heart attack and stroke in Europe leading to higher disability burden compared to the rest of Europe (Abuladze et al. 2013). The dysfunctionally organised formal social care facilities lead to disabled older people taking care of their disabled older relatives, causing stress and burden on a personal level (Tulva & Saia 2012). Therefore higher tendency of family members looking after their older relatives in Estonia might come from necessity – due to lack of other options. There is lack of knowledge regarding the differences in the share of family ties between migrants and native population. We assume that migrants have less family resources available, due to the fact that part of the ties have remained in their country of origin. On the other hand, due to later timing of the demographic transition, migrants may have kept more traditional values and norms which might mean that family members taking care of the older people is a norm among those with later demographic transition (foreign origin population) rather than among the native population with earlier timing of demographic transition. Therefore migrants might be less prone to use formal care facilities and rely more on family ties in the phase when disabilities set on.

The main purpose of this paper is to analyse the relationship between social networks' characteristics and disability outcomes of foreign-origin and native older (aged 50+) populations in Estonia. We analyse the indicators of limitations in everyday activities as this is considered an objective and validated disability status measurement and is also used as the basis for calculating healthy life years (Jagger et al. 2010, Robine et al. 2007). Social networks are analysed within the following aspects: network size, the composition of networks, frequency of interactions and satisfaction with relationships. The main research question of this paper is the following: *What is the role of social networks in the process of development of limitations of everyday activities among older native and foreign-origin populations in Estonia?*

As mentioned above, foreign origin population in Estonia have had equivalent or even higher education level than the native population – therefore we expect them to be more active and mobile which may result in bigger and more diverse networks as well as later onset of disabilities. On the other hand, as migrants are probably less likely to keep their ties from childhood or adolescence, they might have larger networks that consist of weaker ties, i.e. friends etc. As such ties can disappear when (severe) disabilities set on, migrants might not have any network members left who would care for them at later ages. We expect the

weakness of ties to be represented in lower frequency of contacts among foreign origin population, which might mean worse well-being outcomes for the (severely) limited migrants. As migrants are also more susceptible to stigmatisation in the society due to their lack of integration we also expect lower satisfaction with their networks compared to the natives. We treat the indicator of satisfaction with their network situation as the indicator of quality of these networks.

3. Data and methods

We use SHARE (Survey of Health, Ageing and Retirement in Europe) data from wave 4, release 1. The fieldwork for this wave was carried out in 2010-2011 in 16 European countries. We include both men and women from the Estonian dataset aged 50 and above. We address our research question by distinguishing foreign origin population (N=1778) and native (N=4892) population in our analyses.

The SHARE 4th wave Social Network Module was based on the name generator method in which people were asked to name their confidants or with whom they discussed important matters during the previous twelve months. This enables to capture the *personal* networks that are most important to people (Stoeckel & Litwin 2013). This may bias the respondents to name only closer ties. Despite that we define family members, children and spouse as strong personal ties in our analysis whereas friends represent weak personal ties, based on earlier work by Granovetter (1973) and Cornwell (2009). We do not measure the strength of ties in this paper.

We use several logistic regression models to estimate the following personal social network characteristics in association with limitations: the size of networks (0 or 1, 2+), number of family members in network (0 or 1, 2+), number of children in network (0, 1, 2+), having a spouse in network (yes or no), having any friends in network (yes or no), average contact frequency with network members (no contact – less than once a month, once – twice a month, daily contact – several times a week) and satisfaction with social networks (low satisfaction level (0 – 7) or high satisfaction (8-10) based on a 10-point scale). The latter includes satisfaction estimates also for those who don't have any confidants in their personal network. We weigh data with individual calibrated weights so that both foreign origin and native population samples are representative of the total 50+ population groups in Estonia.

The dependent variable in all these models is 'Limitations in everyday activities' based on question PH005 in the SHARE questionnaire which measures disability on the Global Activity Limitation Index (GALI) [1]. GALI has been proved to be an objective and validated disability status measurement (Verbrugge 1997, Jagger et al. 2010). We distinguish three limitation categories: severely limited; limited, but not severely and not limited – we use the latter group as a reference category in all multinomial logistic regression models, thus all results are to be interpreted in relation to the non-limited population.

We control for the following variables within each regression analysis:
Gender – as disabilities and networks can be gender-specific (Crimmins et al. 2011), it is important to control for gender. As men have lower life expectancy by 10 years than women in Estonia, the chances of developing disabilities among men and women might differ because of that. In Estonia the informal care is widely on the shoulders of women (85% of care givers are women) and they mainly deliver the care to their spouses (Tulva & Saia 2012,

[1] The wording of the question PH005 in SHARE was the following: "*For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do?*".

Tammsaar et al. 2013). Also, gender effects may play a role between migrants and natives because of their different gender structure as mentioned earlier.

Age of the respondent – this variable is used as a categorical variable with three age groups: 50-64, 65-74, 75+ referring to different life stages in mid-life and old-age (pre-retirement, post-retirement and the so-called fourth stage (Laslett 1997). People at age 50-64 can have a significantly different life and types of networks than at later ages. Also, people tend to be more active and employed with fewer sicknesses at that time. There is some evidence that recent cohorts of older people may be healthier than their predecessors (e.g. Schoeni et al. 2008), on the other hand, the oldest-old are demonstrating less decline in health than the younger ones over time (e.g. Seeman et al. 2010). Usually the older persons aged 85+ have been regarded as the age at which the deterioration of health is becoming more evident as they are more fragile, but in this analysis the number of 85+ respondents was too small, so we grouped together all those aged 75+.

Education level – this is a categorical variable including three education levels based on the ISCED 1997 categorisations: a) pre-primary and primary level (thus including also those who might not have acquired primary education (ISCED levels 0 - 2), b) secondary and post-secondary, but non-tertiary education (ISCED level 3-4) with a significant share of migrants in Estonia belonging to this group, c) tertiary – including those with university degrees (ISCED levels 5-6).

Partnership status – this variable reflects the real partnership situation despite the official marital status, therefore this is preferred instead of the marital status variable. The variable shows whether the respondent is in partnership or not, thus indicating possible care support resource availability. Spouse or partner is usually the main support resource for disabled old people (Wenger 1997).

Proximity– this is a categorical variable indicating average distance of personal network members from the respondent in three categories: a) living in the same household or within a 1 km distance, b) 1 km – 24 km, c) 25- 500+ km or having no network members. People living in the same household or closer are assumed to look after the disabled older relatives more likely than those living further away. On a relationship level, geographical proximity has an influence on the frequency and types of transfers exchanged (Mulder & van der Meer 2009).

Foreign origin or native population – this variable is included in the regression models for total population analysis. Migrants are defined as those who were not born in Estonia as well as those whose neither parent was born in Estonia (thus including also second generation immigrants). Second generation distinction was possible to specify only in the Estonian SHARE survey, where the birthplace of parents was additionally asked.

We present the logistic regression results for total population, distinguishing the migrant and native origin. In addition, the results of the separate regression models for migrants and natives will be discussed, but tables will not be presented here (available on request).

4. Results

4.1. Descriptive results

The total sample in our analysis included 6670 individuals with 1778 migrants (including second generation) and 4892 native population representatives. The gender and age compositions of the migrant and native populations in our sample are similar (see Table 1). 60% of the migrants and 59% of the natives are female, reflecting a slightly bigger share of women among the Estonian foreign-origin population, but also women's longer life expectancy compared to men in both groups. 43,3% of migrants and 43,8% of natives belong to the 50-64 age group, followed with 33,2% of migrants and 33,4% of natives in the 65-74 age group, in the oldest age group migrants prevail. There are slightly more native people with (pre) primary education level (31%) compared to the migrants (28%) whereas the (post) secondary education prevails among the migrants (51,3% in comparison to 46,5% among the natives). This reflects a higher tendency of migrants in Estonia to have a post-secondary non-tertiary education.

Around 71% of migrants and natives are in partnership (either married or living together) at the time of the interview. Thus a majority have a potential supporter in the form of a partner. There are 45,3% of migrants who have an average network proximity of living with a network member in the same household or within one km whereas there are 42,8% of natives with a close average network proximity. Even though migrants could potentially be more likely to have also contacts with their relatives in the origin country that would increase the distance between the respondent and network members, a smaller share of migrants (14%) than natives (16%) have an average proximity of 25-500 km or no network members. That might also be explained that the method required naming those who are the main confidants and those appear for migrants to be nearer to them than for natives.

Larger share of migrants are severely limited (25,3%) as well as less limited (40,4%) than natives (23,6% and 33,1%, respectively). This confirms earlier findings regarding migrants' poorer health in Estonia compared to the native population.

In terms of the social network characteristics there are more migrants with larger networks (67,9% with two or more network members) than among the natives (62,9%). One-member-networks are more prevalent among the natives - 33% in comparison to 27% among the migrants. Also, among the migrants there are more people with two or more family members in the network (52,8%) than among the natives (51%) whereas there are more natives with one family member (38,8%) than among the migrants (33,5%). The larger share of migrants without any family members (13,5%) compared to natives (10%) might reflect partly their migration history from another country where they might have some relatives left. On the other hand, there are more migrants than natives who have one (33,6%) and two or more children (22,7%) in their network. 48,3% of the natives don't have any children in their networks compared to 43,7% of the migrants. This may partly reflect lower fertility among the older natives, but also different communication patterns.

Although around 71% stated to be in partnership, only 55,4% of the migrants and 58% of the natives report to have a spouse in their personal networks. This result indicates that having a partner does not always bring the emotional support that having a partner is usually associated with. There are also more migrants who have some friends in their personal networks – 28,9% compared to 21,9% among the natives. These ties might be a replacement for the lack of family members that some migrants face.

Around 6,9% of migrants and 6,2% of natives don't have any contact or communicate less than once a month with their network members. 28% of the natives have an intermediate contact frequency with their network – once or two times a month compared to 26,6% of migrants having intermediate contact frequency.

Table 1. Descriptive results (in %)

	Migrants N=1778	**Natives N=4892**
Female	60,3	59,0
Age: 50-64	43,6	43,8
65-74	33,2	33,4
75+	23,2	22,8
Education: No education/ Primary/ Basic	28,0	31,9
(Post) Secondary	51,3	46,5
Tertiary	20,6	21,6
Employment status: Retired	62,1	54,3
Employed	27,0	35,2
Unemployed, sick, homemaker, other	10,9	10,6
In partnership	70,8	71,0
Average network proximity: Same hh-less than 1km	45,3	42,8
1-24 km	39,9	40,6
25-500+km/ none	14,8	16,6
Severely limited	25,3	23,6
Limited, but not severely	40,4	33,1
Network size: 0 members	4,8	4,1
1 member	27,3	33,0
2+ members	67,9	62,9
Number of family members in network: 0	13,7	10,2
1 family member	33,5	38,8
2+ family members	52,8	51,0
Number of children in network: 0	43,7	48,3
1 child	33,6	30,7
2+ children	22,7	20,9
Has a spouse in network	55,4	58,0
Has friends in network	28,9	21,9
Average contact frequency: No contact/ Once a month	6,9	6,2
Once - Twice a month	26,6	28,0
Daily/ Several times a week	66,5	65,8
High satisfaction with network	84,5	85,1

66,5% of migrants and 65,8% of natives keep in touch with their network members frequently – the slightly larger share among migrants reflect their larger share of living together in the same household which provides more opportunity to have daily contact. Finally, there are slightly more natives (85,1%) with high satisfaction levels (8-10 on a scale of 0-10) compared to migrants (84,5%).

4.2. Regression results

Logistic regression models were run with weighted data including both migrant and native population groups in one model. To assess the impact of network size on the population with severe or less severe limitations in everyday life, the reference group was chosen to

consist of non-limited native population with two or more confidants in their personal networks, i.e. the large networks. Results are presented in Table 2.

Network size. Foreign origin population whose networks comprise of at least one confidant or two and more confidants have higher chance to be less limited in their daily activities compared to natives with two or more network members (by 25,9% and 45,2%, respectively). All other groups, including migrants with no confidants as well as natives with no or one confidant member have significantly lower chances of being less limited. Thus larger networks are associated with less severe limitations among both population groups, though the effect is stronger for migrants. This indicates to older people having network resources once the limitations are mild, but these disappear with severe limitations. The finding that the less limited have largest networks (also compared to the non-limited) implies that the less limited may benefit from larger networks with weaker ties. It is possible that older people with no (reported) confidants among both foreign origin and native population might be healthier or with less restricting disabilities – thus they do not need confidant networks to be around. This hypothesis has yet to be investigated when the longitudinal data for Estonia becomes available.

Foreign origin population demonstrates significantly higher chances of being severely limited with all network sizes compared to the natives with two or more confidants in their network, thus they can be considered most vulnerable. The likelihood to be severely limited is biggest for migrants with no confidants (higher by 69% than for the reference group) and with one confidant (higher by 38,3%). Though native population without any confidants is also significantly more likely to be severely limited than those with larger networks (by 11,2%), it is still lower than for migrant population with larger networks (13,5%). Native population with one confidant in the network indicates a significantly lower chance (by 8,5%) of being severely limited, meaning that among the severely limited natives it is also common to have larger networks besides zero-member networks.

Within the groups, less limited migrant men had two or more confidant members and less limited migrant women had one confidant (see Table 3 in Appendix 1). Less limited native men and women both had two or more confidant members in their network. Severely limited migrant women were more likely to have zero confidants or one confidant in their networks. Also severely limited native women had zero confidants in the network whereas severely limited native men had two or more network members. Thus native men indicated most abundant network resources in case of severe as well as less severe limitations. As women live longer than men, men have more potential caretakers by having more women around.

Composition: family members. In order to understand the differences associated with the network size and disablement between two population groups, we also assess the associations between network composition and disablement. Foreign origin population is 20-40% more likely than the natives with two or more family ties to have less severe limitations, given any number of their family ties in the network. Two or more family ties are the most common network composition type among the less limited for both migrants as well as natives.

Foreign origin population with any number of family members in their confidant networks is most likely to be among the severely limited. The likelihood of being severely limited is biggest for migrants with no family members (50,8%) and with one family member (43,6%). They are followed by native population who have no family ties in their network (27,2%) and

migrants with two or more family members in the network (16%) compared to the native population with two or more family members in the network. In general, similarly to larger network size, also larger family networks are associated with being less limited rather than with being severely limited, especially among native men and women and foreign-origin men. Therefore it seems that family networks start to diminish or disappear with the onset of severe limitations, but this assumption has to be confirmed with longitudinal data analysis.

Within the groups (Table 4), less limited migrant men, but also native men and women were more likely to have two or more family ties in their networks whereas migrant women had zero confidants. The severely limited migrant men had one family member while migrant women had zero or also one family member in the network. The severely limited native men had two or more family members while severely limited native women had no family members in the network. Again, both migrant and native men show the most advantageous position in terms of network resources in case of illnesses – this corresponds to men's shorter life expectancy compared to women and thus having someone who would take care of them. For women, especially the severely limited native women there does not seem to be anyone left by the time they develop severe limitations whereas there are two or more family members around for the less limited native women. Also, the fact that some of the severely limited migrant women might have at least one family member around compared to the natives gives indication of different communication patterns, but also about different norms within the two population groups - it might be more common to take care of the older disabled relative among the foreign-origin population than among the natives.

Composition: children. Children are one type of family members, commonly the one to take care of the elderly parent. Population of foreign origin with one child is most likely to be severely limited as well as less limited (by 51,7% and 83,5%, respectively) than natives with two or more children in their personal network. Migrants with no children as well as two and more children are also significantly more likely to be severely as well as less limited than the natives with two or more children. However, natives without children are 7,9% less likely to be less limited, but 23,1% more likely to be severely limited than natives with two or more children. Thus both severely limited as well as less limited migrants have at least one child around. Among the natives the severely limited older people tend to not have any children around while they have one or two and more children around in case of less severe limitations. It might be that other relationships become more dominant for the natives when severe limitations develop.

Within group analyses confirm these results – the severely limited as well as less limited migrant men are most likely to have one child in their networks (Table 5). The severely limited migrant women are most likely to have zero or two and more children in the network while less limited migrant women are most likely to have zero children in the network. The severely limited native men have two or more children around whereas less limited native men tend to have one child around – thus the number of children in men's network may increase when the severe limitations set in. The severely limited women have zero children, while less limited native women have two or more children in the network – thus the network sizes in case of different level of limitations show opposite trends for native men and women. Firstly, the results indicate that there is at least one child around for the migrant population, despite the gender and limitation level. Although migrants have had higher fertility rates than natives in Estonia among the older cohorts, native men seem to have preserved relationships with a larger number of children than the migrants have, especially regarding severe limitations. However, the effect does partly come out for the

severely limited women – there were no significant differences in the likelihood of having zero or two and more children in the network. Secondly, as the severely limited native women are less likely to have family members, including children in the network, they might have other network members around, thus indicating different communication patterns, norms as well as differences in the use of formal care services.

This finding supports the hypothesis that cultural norms among migrants influence the existence and number of children in caring for the disabled old people. In case of onset of limitations in their everyday life, migrants are more likely to have one or more children as confidants in their networks.

Composition: spouse. Spouse is the next most common family member besides children in the network of old disabled people. Migrants with a spouse are 37,8% more likely to be among those who are less limited. Natives without a spouse are not significantly different from the natives with a spouse in the likelihood of being less limited. Also migrants without a spouse are most likely (by 56,7% more) to be severely as well as less limited in their everyday activities than the native population with a spouse. This outcome suggests that when the widowed one is left behind after the spouse dies, there are no other resources to replace the confidant in the migrant population's network. Severely limited migrants with a spouse as well as natives without a spouse are not significantly different compared to the reference group.

Within group analyses indicated that both the severely limited migrant men and women as well as less limited migrant men and women are most likely to not have a spouse (Table 6). However, the likelihood coefficients are bigger for migrant women than men. Also, the severely limited native men and women are more likely to be without a spouse whereas the less limited native women are more likely to have a spouse. Native men without a spouse do not differ in their likelihood of being less limited compared to the natives with a spouse. In general, migrants without a spouse, especially women are more likely to be (severely) limited, making them most vulnerable. These results also reflect women's longer life expectancy compared to men – this creates a situation where women tend to take care of their partners, but by the time the partners have died and women develop their own disabilities, other women have to take care of them.

Composition: friends. Friends represent weaker personal ties in our analysis that in some cases may replace family members when caring for older disabled people. Immigrant population with no friends has a much higher likelihood to be among both the less limited as well as among the severely limited (60,7% and 41,7% respectively) compared to natives who have friends in their network. On the other hand, foreign origin population has also significantly higher likelihood to be among the less limited if they have friends in their network (by 53,7%). The likelihood to be severely limited is only somewhat higher among the natives without friends as well as migrant population with friends, however, the latter group is not significantly different from the reference group. Thus having no friends is associated with severe limitations among both natives and migrants, though the effect is stronger for migrants. Also for both groups, friends drop out when limitations develop, as was expected from weaker ties. In case of natives, they drop out already when less severe limitations develop whereas in case of migrants, this can be seen more clearly when severe limitations develop. Migrants having or not having friends are similarly associated with less severe limitations.

Table 2. Logistic regression models for social network characteristics by limitations in everyday activities

	Severely limited			Limited, but not severely		
	Exp(B)	Sig.	Std. Error	Exp(B)	Sig.	Std. Error
Network size (ref: Native*2+ members)						
Migrant*0 members	1,690	0,000	0,0333	0,743	0,000	0,0351
Migrant*1 member	1,383	0,000	0,0170	1,259	0,000	0,0151
Migrant*2+ members	1,135	0,000	0,0120	1,452	0,000	0,0097
Native*0 member	1,112	0,000	0,0240	0,713	0,000	0,0226
Native*1 member	0,915	0,000	0,0112	0,793	0,000	0,0097
Nagelkerke R Sq			0,1926			0,1926
Number of family ties in network (ref: Native*2+ family ties)						
Migrant*0 family	1,508	0,000	0,0210	1,221	0,000	0,0189
Migrant*1 family tie	1,436	0,000	0,0158	1,261	0,000	0,0135
Migrant*2+ family ties	1,160	0,000	0,0140	1,425	0,000	0,0111
Native*0 family	1,272	0,000	0,0154	0,834	0,000	0,0140
Native*1 family tie	0,982	0,102	0,0110	0,807	0,000	0,0093
Nagelkerke R Sq			0,1919			0,1919
Number of children in network (ref: Native*2+ children)						
Migrant*0 children	1,355	0,000	0,0167	1,183	0,000	0,0140
Migrant*1 child	1,517	0,000	0,0183	1,835	0,000	0,0150
Migrant*2+ children	1,391	0,000	0,0208	1,426	0,000	0,0170
Native*0 children	1,231	0,000	0,0134	0,921	0,000	0,0111
Native*1 child	0,967	0,017	0,0142	1,005	0,677	0,0115
Nagelkerke R Sq			0,1923			0,1923
Spouse in network (ref: Native* has a spouse)						
Migrant* no spouse	1,567	0,000	0,0173	1,567	0,000	0,0147
Migrant* has a spouse	0,985	0,285	0,0146	1,378	0,000	0,0114
Native* no spouse	1,013	0,419	0,0155	0,979	0,094	0,0130
Nagelkerke R Sq			0,1900			0,1900
Friends in network (ref: Native* has friends)†						
Migrant* no friends	1,417	0,000	0,0145	1,609	0,000	0,0122
Migrant* has friends	1,020	0,277	0,0182	1,537	0,000	0,0143
Native* no friends	1,026	0,033	0,0121	1,096	0,000	0,0100
Nagelkerke R Sq			0,1926			0,1926
Contact frequency (ref: Native*daily - several times a week)						
Migrant* never - less than once a month	1,948	0,000	0,0293	0,987	0,664	0,0299
Migrant* once a –every two weeks	1,049	0,008	0,0180	1,465	0,000	0,0145
Migrant* daily - several times a week	1,259	0,000	0,0121	1,505	0,000	0,0101
Native* never - less than once a month	0,996	0,840	0,0213	0,903	0,000	0,0189
Native* once -twice a month	0,963	0,002	0,0120	0,963	0,000	0,0100
Nagelkerke R Sq			0,1894			0,1894
Satisfaction (Native* high satisfaction)						
Migrant* low satisfaction	1,713	0,000	0,020195	1,274	0,000	0,018833
Migrant* high satisfaction	1,295	0,000	0,010717	1,602	0,000	0,008807
Native* low satisfaction	1,476	0,000	0,013278	1,422	0,000	0,011612
Nagelkerke R Sq			0,1878			0,1878

Source: SHARE wave 4, release 1, weighted data

All models control for gender (ref: female), age (ref: 75+), education (ref: tertiary), partnership (ref: with

†This model also controls for the number of family (ref: 2+) ties in network

Within group analyses indicate that both migrant and native men have less diverse networks than women when they have limitations, no matter the severity level – they lack friends in their confidant networks compared to non-limited men (Table 7). Severely limited men tend to have at least one family member as confidant (in case of migrants) or even two or more family members (in case of natives) as previous regression models showed, thus having family members around compensates for the lack of friends.

Migrant severely limited men and women have less diverse networks than their native counterparts. Severely limited native women are even 4,5% more likely to have friends in their personal network, meaning that some of them can be also caregivers which would confirm the results of a recent study in Estonia that showed that 13% of caregivers are friends, and that the majority of caregivers are women (Tammsaar et al. 2013). Less limited native women were 3,4% more likely to not have friends compared to the non-limited native women, but less limited women tend to have family members around. These results point towards migrants not keeping their weaker ties in older ages if they had developed them earlier, or not being able to keep them due to illness (reciprocity barriers) to as large extent as native population, especially women. Again, this tendency might be also related to the social norms and values of the migrant population that foresee mainly family members as caretakers of disabled older relatives.

Contact frequency. Immigrant population with intermediate (once a week or every two weeks) or frequent (daily to several times a week) contacts is most likely to be less limited, with the latter being less limited 50,5% more likely than natives with frequent contacts. Also natives with frequent contacts are more likely than other natives and migrants with a low contact frequency to be less limited, indicating that both among migrants as well as natives being less limited is associated with higher contact frequency.

Migrants with no or rare contact (up to once a month) are almost two times (or by 94,8%) more likely to be severely limited than natives with daily contact or with a contact frequency of several times a week. Attention should be paid to the fact that migrants with the most frequent contacts have also much higher likelihood (by 25,9%) of being severely limited than migrants with intermediate contact frequency who are only 4,8% more likely to be severely limited compared to the natives with frequent contacts. Native population with no or small contact frequency is equally likely to be severely limited as natives with frequent contacts whereas natives with intermediate contact frequency are significantly less likely to be severely limited. Thus both those with frequent and rare contacts can be severely limited among migrants and natives, though among migrants those with no or rare contacts are clearly the most vulnerable group. There are network members around when the limitations set in, but the likelihood of no contact increases for migrants when the severe limitations develop, reflecting partly difficulties in participating in reciprocal social relations.

Within group analyses indicated that migrant and native men with intermediate contact frequency are most likely to be less limited – 33,6% and 7,5% higher likelihood than men with frequent contact, respectively (Table 8). Again, the effect is stronger among migrants. Among natives though, also men with no or little contact have significantly higher (by 5,7%) likelihood of being less limited. Both migrant and native women with frequent contact (daily or several times a week) are most likely to be less limited. Therefore if the associations between network contact frequency and limitations act in a similar direction for women, they are opposite for men.

Migrant men with no or little contact are 1,5 times more likely than migrant men with frequent contact to be severely limited. Migrant men with an intermediate contact are least likely to be severely limited. Among native men, those with intermediate contact are most likely (20,5% more likely than men with frequent contact) to be severely limited whereas those with no or little contact are 11,1% less likely to be severely limited. Both migrant and native women with no or rare contact are most likely to be severely limited compared to women with frequent contacts, though the effect is stronger among migrants (19,2% higher likelihood) than natives (9,5%). The results indicate that native men tend to have more contact as the severe limitations develop whereas migrant men's contact frequency decreases in case the severe limitations set in. This suggests that part of the foreign origin population might have fallen into structural holes (Burt, 1992) due to their networks falling apart by the old age and when the severe limitations set on.

Contact frequency results reflect the differences in network size between the less limited and the severely limited. As the number of network members decreases for the severely limited, also contact frequency decreases for them, especially for women who among the less limited have frequent contacts with their network members, but among the severely limited have no or rare contact with their network prevailing.

Satisfaction with personal relationships. As a general indicator of being content with the situation of their personal networks and relationships, satisfaction with all network contacts has been used for modelling the likelihood of being limited in everyday activities. Also people with no reported personal networks were included in the satisfaction estimation. Compared to the native population with high satisfaction level, foreign origin population with high satisfaction level is 60,2% more likely to be less limited, whereas their peers with low satisfaction have 27,4% higher likelihood of being less limited compared to native population with high satisfaction. Native population with low satisfaction has 42,2% higher likelihood of being less limited than their peers with high satisfaction.

Foreign origin population with low satisfaction has the highest likelihood of being severely limited (71,3%), followed by the native population with low satisfaction (47,6%) and population of immigrant origin with high satisfaction (29,5%) in comparison to the native population with high satisfaction.

Within group regression results show that native women with lower satisfaction levels also show higher likelihood of being less limited compared to native women with high satisfaction levels (Table 9). However, migrant women with lower satisfaction show smaller odds of being less limited than migrant women with high satisfaction levels. Similarly, migrant men with low satisfaction levels are less likely to be less limited and native men with low satisfaction levels are more likely (56,4%) to be less limited than men with higher satisfaction levels.

Men with lower satisfaction levels are significantly more likely to be severely limited than men with higher satisfaction levels – both among migrants (88,7% more likely) and natives (22,7%). Migrant women with lower satisfaction levels do not differ from those with higher satisfaction in the likelihood of being severely limited. Native women with low satisfaction with their confidant networks also show significantly higher likelihood (65,4%) of being severely limited. Thus native population's lower satisfaction levels are also associated with being more (severely) limited, whereas among migrants this holds true only in case of severely limited men. Other migrant groups showed no difference in satisfaction levels or for the less limited the satisfaction levels were high. Thus, our expectation that foreign origin

population might also feel less satisfaction in their network situation and that might be partly increasing the likelihood to be among the limited, was only confirmed for the severely limited migrant men.

5. Discussion

Our analysis brought out that two different population groups have some similarities, but also significant differences in their network characteristics when the disabilities set in. This reaffirms the need to study foreign origin and native population characteristics separately, particularly in countries where the immigrant population forms a significant proportion and thus may distort the averages of the country.

The analysis indicated that network size is big for the less limited, but there tends to be no network members for the severely limited. This was the same for foreign origin as well as native population. The same pattern emerged when the number of family ties was analysed – networks are big for the less limited, but disappear for the severely limited. However, the fact that network size and the number of family ties are bigger for the less limited than the non-limited, confirms Cornwell's findings (2009) partly - the networks of older Estonians increase when mild limitations develop, but they disappear when the restrictions become more severe. This finding is very worrisome, if on a personal level the lack of network resources is combined with the lack of formal care organisation in the country. We treated severe and less severe limitations as consecutive events in the lives of the population groups and interpreted the outcomes from this point of view, however, longitudinal data would give more accurate conclusions about the decrease of network size between different limitation statuses on the individual level. Also, the hypothesis regarding people with no confidants being healthier should be tested when longitudinal data for Estonia becomes available.

Even though the descriptive results indicated that there were a larger proportion of migrants with two or more network members than natives, there was no confirmation of this when we checked the associations with regression models. Also, migrants did not have less family ties in their networks which we initially expected due to their mobility. It might be that family members that are in Estonia (children, spouse) have replaced family members from their origin country (parents, siblings) and with them even stronger ties have been formed.

Nevertheless, migrants tend to have stronger ties rather than weaker ties in their personal networks compared to the native population in case of having severe and less severe limitations. Among migrants, one could see at least one child in the network for both severely limited and less limited men and women. Severely limited native women were more likely to not have any children around, indicating to possible differences in the values and norms between the two population groups. Interestingly, there were two or more children among the severely limited native men and one child among the less limited native men which points towards big gender differences when children as main caretakers are considered for the native population.

Though strong ties in the form of children remain in migrants' networks with the development of limitations in everyday activities, there is no spouse among the disabled migrants. There are smaller differences in having or not having a spouse among the natives between different limitation categories, however, the less limited natives are more likely to have a spouse in their networks. Thus there are mixed results regarding the existence of strong ties among the older disabled people – it is more probable that a spouse and children

are there among the less limited native population. Children are the main caretakers of migrant people with limitations.

In support of the different social norms and values between the population groups, we found that severely limited native women were most likely to have friends in their personal network. Therefore lack of children in their networks seems to be partly compensated with having friends, which make their networks more diverse in comparison to other groups. This result also coincides with a recent study that found that 13% of caretakers in Estonia are friends. Also the majority of caretakers, but also care receivers are women (Tammsaar et al. 2013). This corresponds to women's longer life expectancy – women live longer than men, so they have a higher likelihood of developing severe limitations than men who die before their everyday activities become too restricted. On the other hand, as there are more women than men alive, there are also more potential network resources in the form of women. This way (less) disabled women may often provide help to other (severely) disabled women.

There was high contact frequency for the less limited migrants as well as natives, reflecting also higher network size for the less limited than for the non-limited population. For the severely limited migrants the contact frequency was rare but there was also higher likelihood of being severely limited among the migrants with rare and frequent contacts compared to native population with frequent contacts. Native population did not demonstrate significantly different patterns in contact frequency when severely limited. Thus we observed two distinct patterns among the migrant population, significantly more vulnerable in terms of severe limitations in the everyday activities is the group who has no contact or contact less than once a month. On the other hand, foreign origin population seems to have another group where the contact frequency increases when they are severely limited compared to native population with frequent contacts. However, if we treat as if less limited group had got their limitations earlier, then with severe limitations setting in we observe a decrease in contact frequency for the migrants. This has to be confirmed with longitudinal data and assessing which contacts are decreasing, whether those with weak or strong ties.

Finally, satisfaction was lower only among the severely limited migrant men, whereas in other cases a lower satisfaction with limitations was not observed for migrants which we initially expected. Instead, all natives had lower satisfaction levels with severe and less severe limitations which are related to these groups often having worse social network parameters. In the case of less limited migrants, they even had higher satisfaction with their personal networks than compared to the non-limited migrants. However, as less severe limitations often came with larger network size and more frequent communication patterns, it also reflects that migrants are satisfied with this situation (whereas less limited natives are not). It is also possible that if migrants are satisfied with their networks, then the differences in personal networks between migrants and natives do not impact the differences in limitations of everyday activities or disabilities to such an extent, but it is rather the differences in the morbidity structure of the population groups (Sakkeus & Karelson 2012).

Clear gender differences appeared, especially among the native population. Severely limited native men were more likely to have big networks, more family members and more children in them as well as higher contact frequency with their network members. Thus it does not seem that severe limitations have hampered communication for native men. Severely limited native women, on the other hand, were more likely to have friends in their network, indicating a more diverse network but also corresponding to expectation that women who

have higher education levels develop more diverse networks which develop into strong ties. Less limited native women were also more likely to have more children around as well as have higher contact frequency than native men. It is possible that as a self-reported measure of limitations, men overestimate their limitations in everyday activities to be severe compared to women who indeed might have difficulties in reciprocating in social relations in later ages. It is also more likely that there are more women alive for men to be around than there are for women. There were fewer gender differences among migrants.

In conclusion, it must be said that population of immigrant origin in Estonia seems to display much higher chances to be among severely limited whatever the network characteristics have been investigated in comparison to native population. But they also demonstrate that there are differences in network characteristics when one is less limited as opposed to being severely limited. In our analysis we treated these two phenomena as consecutive events, however, more insight in the development of network characteristics in the process of disablement is needed to understand the supporting structures of the foreign origin and native population in older ages.

6. Limitations of the study

One of the limitations of this study is that the sample includes some individuals who live together in the same household (e.g. partners). As we used individual as the main unit of analysis, not the household, it is possible that some men and women have reported similar type of information (as a partner may be included in their personal networks).

Also, we have used cross-sectional data because Estonia participated in the SHARE survey only starting from wave 4, so there is no longitudinal data available yet to analyse the changes in social networks over time. Therefore the current paper is an account of the situation which we hope to continue to investigate when the longitudinal data on network aspects become available in 2017.

Finally, we have not analysed values and norms separately, although a bulk of our theoretical background leans on assumptions related to changes in values. Therefore we cannot conclude yet whether the current status of social networks and associations with disabilities comes from change in social values (also, we don't observe *change* of values over time). However, through analysing social networks of older people and distinguishing different population groups we have tried to provide a basis for a more thorough look at the transforming social values during the second demographic transition in relation to social networks.

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Appendix 1.

Table 3. Logistic regression results for network size, by limitations in everyday activities and population group

	SEVERELY LIMITED						LIMITED, BUT NOT SEVERELY					
	MIGRANTS			**NATIVES**			**MIGRANTS**			**NATIVES**		
	Exp(B)	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**
Gender (ref: women)												
Men	0,820	0,000	0,0241	1,121	0,000	0,0135	0,775	0,000	0,0180	0,995	0,668	0,0112
Age (ref: 75+)												
50- 64	0,235	0,000	0,0314	0,375	0,000	0,0181	0,533	0,000	0,0279	0,494	0,000	0,0160
65- 74	0,283	0,000	0,0252	0,399	0,000	0,0134	0,533	0,000	0,0244	0,671	0,000	0,0127
Education (ref: tertiary)												
(Pre) primary	2,730	0,000	0,0270	1,961	0,000	0,0149	1,555	0,000	0,0220	1,285	0,000	0,0121
(Post) secondary	1,790	0,000	0,0243	1,717	0,000	0,0140	1,349	0,000	0,0171	1,271	0,000	0,0104
Partnership (ref: with partner)												
No partner	1,328	0,000	0,0196	0,991	0,400	0,0110	1,020	0,223	0,0161	1,040	0,000	0,0094
Employment status (ref: unemployed, sick, homemaker)												
Retired	0,813	0,000	0,0302	0,598	0,000	0,0189	1,234	0,000	0,0261	0,673	0,000	0,0170
Employed	0,088	0,000	0,0332	0,123	0,000	0,0163	0,510	0,000	0,0221	0,380	0,000	0,0138
Proximity of network (25-500+ km / none)												
Same household - up to 1 km	1,060	0,049	0,0296	1,251	0,000	0,0161	1,138	0,000	0,0243	1,152	0,000	0,0136
1 - 24 km	0,768	0,000	0,0289	1,217	0,000	0,0150	1,110	0,000	0,0234	1,132	0,000	0,0125
Interactions (ref: size 2+)												
Men * 0 network members	0,951	0,392	0,0581	0,864	0,000	0,0322	0,639	0,000	0,0504	0,708	0,000	0,0288
Men * 1 network member	1,040	0,212	0,0316	0,907	0,000	0,0168	0,767	0,000	0,0256	0,806	0,000	0,0145
Women * 0 network members	1,158	0,005	0,0526	1,617	0,000	0,0336	0,409	0,000	0,0567	0,667	0,000	0,0347
Women * 1 network member	1,234	0,000	0,0261	0,957	0,002	0,0143	1,020	0,381	0,0227	0,767	0,000	0,0126

Table 4. Logistic regression results for number of family members, by limitations in everyday activities and population group

	SEVERELY LIMITED						LIMITED, BUT NOT SEVERELY					
	MIGRANTS			**NATIVES**			**MIGRANTS**			**NATIVES**		
	Exp(B)	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**
Gender (ref: women)												
Men	0,831	0,000	0,0275	1,215	0,000	0,0153	0,885	0,000	0,0204	1,070	0,000	0,0125
Age (ref: 75+)												
50- 64	0,236	0,000	0,0314	0,374	0,000	0,0181	0,549	0,000	0,0279	0,506	0,000	0,0160
65- 74	0,286	0,000	0,0253	0,399	0,000	0,0134	0,545	0,000	0,0244	0,684	0,000	0,0127
Education (ref: tertiary)												
(Pre) primary	2,792	0,000	0,0270	1,965	0,000	0,0149	1,525	0,000	0,0220	1,271	0,000	0,0121
(Post) secondary	1,787	0,000	0,0243	1,716	0,000	0,0140	1,332	0,000	0,0171	1,268	0,000	0,0104
Partnership (ref: with partner)												
No partner	1,326	0,000	0,0201	0,947	0,000	0,0112	1,031	0,064	0,0165	1,070	0,000	0,0096
Employment status (ref: unemployed, sick, homemaker)												
Retired	0,803	0,000	0,0302	0,604	0,000	0,0189	1,246	0,000	0,0261	0,678	0,000	0,0170
Employed	0,087	0,000	0,0333	0,125	0,000	0,0163	0,519	0,000	0,0221	0,382	0,000	0,0138
Proximity of network (25-500+ km / none)												
Same household - up to 1 km	0,980	0,418	0,0254	1,217	0,000	0,0149	1,288	0,000	0,0218	1,190	0,000	0,0129
1 - 24 km	0,724	0,000	0,0252	1,210	0,000	0,0138	1,271	0,000	0,0211	1,186	0,000	0,0117
Interactions (ref: family size 2+)												
Men * 0 family	0,819	0,000	0,0423	0,991	0,714	0,0250	0,647	0,000	0,0334	0,719	0,000	0,0223
Men * 1 family member	1,184	0,000	0,0321	0,885	0,000	0,0172	0,696	0,000	0,0251	0,748	0,000	0,0147
Women * 0 family	1,243	0,000	0,0312	1,604	0,000	0,0189	1,083	0,004	0,0275	0,885	0,000	0,0177
Women * 1 family member	1,191	0,000	0,0247	1,078	0,000	0,0138	1,047	0,024	0,0204	0,833	0,000	0,0117

Table 5. Logistic regression results for number of children in the network, by limitations in everyday activities and population group

	SEVERELY LIMITED						LIMITED, BUT NOT SEVERELY					
	MIGRANTS			**NATIVES**			**MIGRANTS**			**NATIVES**		
	Exp(B)	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**
Gender (ref: women)												
Men	0,000	0,613	0,0440	0,000	1,299	0,0239	0,183	0,958	0,0320	0,000	0,928	0,0200
Age (ref: 75+)												
50- 64	0,000	0,230	0,0314	0,000	0,370	0,0182	0,000	0,549	0,0280	0,000	0,503	0,0160
65- 74	0,000	0,276	0,0253	0,000	0,396	0,0134	0,000	0,555	0,0244	0,000	0,680	0,0127
Education (ref: tertiary)												
(Pre) primary	0,000	2,703	0,0270	0,000	1,990	0,0149	0,000	1,525	0,0220	0,000	1,266	0,0121
(Post) secondary	0,000	1,753	0,0244	0,000	1,712	0,0140	0,000	1,344	0,0171	0,000	1,269	0,0104
Partnership (ref: with partner)												
No partner	0,000	1,368	0,0196	0,030	0,976	0,0110	0,183	1,022	0,0161	0,008	1,025	0,0094
Employment status (ref: unemployed, sick, homemaker)												
Retired	0,000	0,809	0,0303	0,000	0,607	0,0189	0,000	1,203	0,0261	0,000	0,673	0,0170
Employed	0,000	0,087	0,0333	0,000	0,126	0,0163	0,000	0,512	0,0222	0,000	0,382	0,0138
Proximity of network (25-500+ km / none)												
Same household - up to 1 km	0,013	1,063	0,0245	0,000	1,137	0,0141	0,000	1,338	0,0212	0,000	1,161	0,0122
1 - 24 km	0,000	0,732	0,0246	0,000	1,191	0,0134	0,000	1,281	0,0207	0,000	1,224	0,0114
Interactions (ref: 2+ children)												
Men * 0 children	0,098	1,074	0,0431	0,528	0,986	0,0224	0,000	0,663	0,0310	0,006	0,948	0,0192
Men * 1 child	0,000	1,678	0,0468	0,000	0,851	0,0260	0,012	1,090	0,0343	0,000	1,131	0,0218
Women * 0 children	0,114	0,957	0,0279	0,000	1,381	0,0164	0,447	0,982	0,0233	0,000	0,901	0,0137
Women * 1 child	0,000	0,874	0,0282	0,002	1,053	0,0167	0,000	1,325	0,0229	0,037	0,972	0,0134

Table 6. Logistic regression results for having a spouse in the network, by limitations in everyday activities and population group

	SEVERELY LIMITED						LIMITED, BUT NOT SEVERELY					
	MIGRANTS			**NATIVES**			**MIGRANTS**			**NATIVES**		
	Exp(B)	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**
Gender (ref: women)												
Men	0,000	0,853	0,0264	0,000	1,156	0,0145	0,000	0,768	0,0197	0,000	0,947	0,0119
Age (ref: 75+)												
50- 64	0,000	0,230	0,0313	0,000	0,376	0,0181	0,000	0,537	0,0278	0,000	0,496	0,0160
65- 74	0,000	0,279	0,0252	0,000	0,397	0,0134	0,000	0,540	0,0243	0,000	0,676	0,0127
Education (ref: tertiary)												
(Pre) primary	0,000	2,750	0,0270	0,000	1,946	0,0149	0,000	1,523	0,0220	0,000	1,270	0,0121
(Post) secondary	0,000	1,789	0,0243	0,000	1,704	0,0140	0,000	1,338	0,0171	0,000	1,271	0,0104
Partnership (ref: with partner)												
No partner	0,000	1,163	0,0288	0,000	0,876	0,0160	0,000	0,859	0,0230	0,000	1,060	0,0139
Employment status (ref: unemployed, sick, homemaker)												
Retired	0,000	0,807	0,0302	0,000	0,596	0,0189	0,000	1,238	0,0260	0,000	0,676	0,0170
Employed	0,000	0,088	0,0332	0,000	0,123	0,0163	0,000	0,523	0,0221	0,000	0,385	0,0139
Proximity of network (25-500+ km / none)												
Same household - up to 1 km	0,000	1,108	0,0265	0,000	1,219	0,0149	0,000	1,398	0,0229	0,000	1,131	0,0131
1 - 24 km	0,000	0,754	0,0250	0,000	1,198	0,0137	0,000	1,387	0,0213	0,000	1,233	0,0118
Interactions (ref: has a spouse)												
Men * no spouse	0,024	1,084	0,0356	0,000	1,082	0,0209	0,000	1,104	0,0277	0,352	0,983	0,0183
Women * no spouse	0,000	1,303	0,0349	0,000	1,248	0,0191	0,000	1,325	0,0268	0,000	0,933	0,0161

Table 7. Logistic regression results for number of friends in the network, by limitations in everyday activities and population group

	SEVERELY LIMITED						LIMITED, BUT NOT SEVERELY					
	MIGRANTS			**NATIVES**			**MIGRANTS**			**NATIVES**		
	Exp(B)	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**
Gender (ref: women)												
Men	0,000	0,631	0,0360	0,132	0,967	0,0225	0,000	0,581	0,0263	0,000	0,779	0,0192
Age (ref: 75+)												
50- 64	0,000	0,237	0,0314	0,000	0,372	0,0181	0,000	0,542	0,0279	0,000	0,503	0,0160
65- 74	0,000	0,285	0,0253	0,000	0,395	0,0134	0,000	0,543	0,0244	0,000	0,681	0,0127
Education (ref: tertiary)												
(Pre) primary	0,000	2,709	0,0271	0,000	1,967	0,0150	0,000	1,534	0,0221	0,000	1,250	0,0122
(Post) secondary	0,000	1,772	0,0243	0,000	1,710	0,0140	0,000	1,344	0,0171	0,000	1,262	0,0105
Partnership (ref: with partner)												
No partner	0,000	1,399	0,0198	0,049	0,979	0,0110	0,143	1,024	0,0161	0,000	1,036	0,0095
Employment status (ref: unemployed, sick, homemaker)												
Retired	0,000	0,803	0,0302	0,000	0,602	0,0189	0,000	1,235	0,0260	0,000	0,673	0,0170
Employed	0,000	0,087	0,0332	0,000	0,124	0,0163	0,000	0,518	0,0220	0,000	0,383	0,0138
Proximity of network (25-500+ km / none)												
Same household - up to 1 km	0,050	1,049	0,0243	0,000	1,162	0,0139	0,000	1,298	0,0210	0,000	1,137	0,0121
1 - 24 km	0,000	0,772	0,0248	0,000	1,168	0,0134	0,000	1,373	0,0210	0,000	1,267	0,0115
Interactions (ref: has friends)												
Men * no friends	0,000	1,529	0,0351	0,001	1,074	0,0211	0,000	1,308	0,0258	0,000	1,355	0,0183
Women * no friends	0,000	1,140	0,0234	0,001	0,955	0,0140	0,540	0,989	0,0188	0,004	1,034	0,0117

Table 8. Logistic regression results for contact frequency with network members, by limitations in everyday activities and population group

	SEVERELY LIMITED						LIMITED, BUT NOT SEVERELY					
	MIGRANTS			**NATIVES**			**MIGRANTS**			**NATIVES**		
	Exp(B)	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**
Gender (ref: women)												
Men	0,813	0,000	0,0241	0,971	0,025	0,0131	0,600	0,000	0,0190	0,909	0,000	0,0112
Age (ref: 75+)												
50- 64	0,225	0,000	0,0317	0,380	0,000	0,0183	0,531	0,000	0,0282	0,500	0,000	0,0162
65- 74	0,278	0,000	0,0255	0,402	0,000	0,0136	0,545	0,000	0,0246	0,679	0,000	0,0129
Education (ref: tertiary)												
(Pre) primary	2,911	0,000	0,0276	1,960	0,000	0,0150	1,597	0,000	0,0223	1,287	0,000	0,0122
(Post) secondary	1,951	0,000	0,0249	1,705	0,000	0,0141	1,366	0,000	0,0173	1,279	0,000	0,0105
Partnership (ref: with partner)												
No partner	1,345	0,000	0,0200	0,962	0,001	0,0111	1,007	0,689	0,0163	1,018	0,055	0,0095
Employment status (ref: unemployed, sick, homemaker)												
Retired	0,794	0,000	0,0306	0,602	0,000	0,0191	1,189	0,000	0,0265	0,676	0,000	0,0172
Employed	0,079	0,000	0,0349	0,126	0,000	0,0164	0,493	0,000	0,0225	0,385	0,000	0,0140
Proximity of network (25-500+ km / none)												
Same household - up to 1 km	1,232	0,000	0,0326	1,161	0,000	0,0170	1,201	0,000	0,0262	1,151	0,000	0,0145
1 - 24 km	0,953	0,113	0,0306	1,142	0,000	0,0149	1,229	0,000	0,0243	1,221	0,000	0,0126
Interactions (ref: contact daily/ several times a week)												
Men * never - once a motnh	1,504	0,000	0,0542	0,889	0,000	0,0297	0,952	0,301	0,0472	1,057	0,028	0,0251
Men * once - every two weeks	0,645	0,000	0,0380	1,205	0,000	0,0196	1,336	0,000	0,0269	1,075	0,000	0,0171
Women * never - once a motnh	1,192	0,000	0,0460	1,095	0,001	0,0274	0,515	0,000	0,0459	0,734	0,000	0,0266
Women * once - every two weeks	0,887	0,000	0,0259	0,874	0,000	0,0144	0,816	0,000	0,0211	0,921	0,000	0,0120

Table 9. Logistic regression results for satisfaction with personal networks, by limitations in everyday activities and population group

	SEVERELY LIMITED						LIMITED, BUT NOT SEVERELY					
	MIGRANTS			**NATIVES**			**MIGRANTS**			**NATIVES**		
	Exp(B)	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**	**Exp(B)**	**Sig.**	**S.E.**
Gender (ref: women)												
Men	0,720	0,000	0,0214	1,100	0,000	0,0116	0,686	0,000	0,0165	0,906	0,000	0,0098
Age (ref: 75+)												
50- 64	0,216	0,000	0,0319	0,362	0,000	0,0184	0,499	0,000	0,0283	0,504	0,000	0,0161
65- 74	0,280	0,000	0,0258	0,396	0,000	0,0136	0,517	0,000	0,0248	0,683	0,000	0,0128
Education (ref: tertiary)												
(Pre) primary	2,929	0,000	0,0275	1,895	0,000	0,0150	1,546	0,000	0,0224	1,246	0,000	0,0121
(Post) secondary	1,931	0,000	0,0247	1,700	0,000	0,0141	1,418	0,000	0,0174	1,249	0,000	0,0105
Partnership (ref: with partner)												
No partner	1,314	0,000	0,0193	0,930	0,000	0,0107	1,021	0,201	0,0159	0,963	0,000	0,0091
Employment status (ref: unemployed, sick, homemaker)												
Retired	0,702	0,000	0,0304	0,588	0,000	0,0192	1,250	0,000	0,0265	0,697	0,000	0,0172
Employed	0,088	0,000	0,0328	0,127	0,000	0,0165	0,524	0,000	0,0225	0,403	0,000	0,0140
Interactions (ref: high satisfaction)												
Men * low satisfaction	1,887	0,000	0,0374	1,227	0,000	0,0195	0,917	0,008	0,0329	1,564	0,000	0,0166
Women * low satisfaction	1,000	0,997	0,0283	1,654	0,000	0,0177	0,683	0,000	0,0252	1,236	0,000	0,0161